West Virginia Engineering Standard

Recreation Land Grading and Shaping (acre)

Definition

Altering the surface of the land to meet the requirements of recreation facilities.

Scope

This standard applies where modification of the land surface is required to permit installation of recreation facilities.

Purpose

To permit effective use of the land area for recreation.

Conditions where practice applies

On sites where surface irregularities, slopes, kinds of soil, obstructions, or wetness interfere with planned recreational use; or where such use requires designed land surfaces. ***Facility sites requiring land grading or shaping may include building areas, playgrounds, parking areas, camp sites, etc., and may include areas to be stabilized by surfacing or establishment of vegetation.[1]***

Special attention shall be given to maintaining or improving habitat for fish and wildlife where applicable.

Planning considerations

Water Quantity

1. Effects of grading on runoff and surface storage.

2. Effects of the amount and timing of decreased infiltration on evapotranspiration, change in soil moisture in the root zone, and deep percolation.

Water Quality

1. Effects of erosion and sediment yield on changes in runoff. Factors are the slope of the land before and after grading, the results caused by the construction process, and the amount of vegetation reestablished on the graded or shaped site.

2. Effects on ground water quality of decreased loading of dissolved pollutants, particularly the dissolved nutrients from decaying surface residues.

3. Effects of increased recreation and activities on the quality of both surface and ground water quality.

Design criteria

The plan shall show location, slope, and elevation of surfaces to be graded and drainage practices and diversions required. It shall include location and magnitude of 'cuts' and 'fills' where exact finished grades are required.

Shaping. If only shaping is required, the cuts and fills may be estimated by observation or by a minimum amount of work with engineer's level.

Grading. If grading to uniform surfaces is required, the design shall be based on a complete topographic or grid survey.

Earthwork. Sideslopes of fills and cuts shall be no steeper than 2h:1v unless in rock or hard shale. Design slopes should vary in accordance with the stability of the soil except as herein provided.

All fills shall be compacted in accordance with the requirements of the facility as determined by the engineer.

The finished grade will be in accordance with the requirements of the facility as determined by the engineer. On most areas, the surface shall have a continuous slope without grade reversals to an outlet to facilitate drainage. The length and degree of designed slope shall be within limits suitable to the soil type without causing erosion or ponding.

Depth of grading shall be controlled to prevent undue exposure of, or cuts into, parent material.

Erosion control and drainage. The requirements for erosion control and surface and subsurface drainage shall be included in the plan.

Surface drainage, waterways, diversions, subsurface drains, and underground outlets shall meet the requirements of the applicable SCS practice standard.

Specific uses. Grading and shaping for specific uses, such as athletic fields shall be according to the requirements of the intended use.

Safety. Features to protect recreation area users shall be planned, if appropriate.

Vegetation. ***Disturbed areas shall be vegetated as soon as practicable after grading. Vegetation shall be done in accordance with the standard for Critical Area Planting (342).***

Operation and Maintenance

An operation and maintenance plan shall be developed for the area treated. The plan shall be provided to, and discussed with, the land operator. Items that should be considered in the plan are:

1. Periodic inspections.

2. Maintenance of the area by mowing or chemical weed control, where appropriate.

3. Repair of eroding areas.

4. Repair of settlement areas where stump holes were filled or buried vegetative waste has deteriorated.

5. Maintenance of vegetation, where required, by fertilization, liming, or reseeding.

Plans and specifications

Plans and specifications for recreation land grading and shaping shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Specifications may be developed from applicable NEH-20, or West Virginia 700 series specifications. For small jobs the attached construction specification may be used.

1 Bold italics are added by West Virginia.

Construction Specification

The land to be graded shall be cleared of excess vegetative matter and trash. Special attention shall be given to saving and maintaining key trees and other vegetation that have scenic value, provide shade, reduce erosion and runoff, provide den or food for wildlife, or add to the quality of the area.

Surface soil shall be removed from the area to the depth shown on the drawings and stockpiled on the outer perimeter of the work area. Upon completion of grading operations the surface soil will be spread over the area shown on the drawings.

If required, the ground surface shall be plowed or disked prior to the grading or shaping operation.

Lift thickness, compaction, overfill allowance, and moisture content of the fill material shall be as described on the drawings.

All grading and shaping operations shall be done to the neat lines and grades shown on the drawings.

Construction shall be done in such a way that chemicals, fuels, lubricants, and waste materials will not pollute air and water. Erosion, air pollution, and water pollution shall be minimized and held within legal limits.

Construction methods and vegetative measures that prevent erosion and control sediment shall be used.

A protective cover of vegetation shall be established on all exposed surfaces where soil and climatic conditions permit. Lime and fertilizer shall be spread at the specified rate and shall be disked into the soil to a depth of 4 inches to prepare a seedbed. Seed and mulch shall be applied at the specified rate. In some cases, temporary vegetation may be used for protection until conditions are suitable for establishment of permanent vegetation.

Where soil or climatic conditions do not permit the establishment of vegetation, and protection is needed, nonvegetative means such as mulches or gravel may be used.

All work shall be done such that the installed practice gives a completed and finished appearance.